The Swiftlets (*Collocalia*) of Java and their Relationships

BY

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INTRODUCTION

In 1960/61 I spent six months in Indonesia engaged on a study of the swiftlets (Aves, Apodidae, genus *Collocalia* Gray) of Java. The genus is widespread in south-east Asia, and all species characteristically nest in caves or cave-like situations. I was able to travel freely in the provinces of West Java, Central Java, and Jogjakarta, where I investigated most regions of limestone outcrop and many known *Collocalia* nesting sites. Breeding colonies of five species were located, one of which (*C. maxima*) had not previously been recorded from Java. In the following pages, the specimens collected are listed by locality, and are described briefly; heights A.S.L. are given in metres. All measurements are given in millimetres; the furcation of the tail is given as the difference in length between the longest (outer) and shortest (inner) pairs of retrices, expressed as a percentage of the length of the longest pair.

In this difficult genus the form and materials of the nest are of taxonomic importance (Sims 1961). Accordingly, as many specimens as possible were collected on or in close association with nests, and these are described in some detail. On the basis of nest-type as well as external morphology, the interrelations between Javanese forms and other *Collocalia* in adjacent regions (including India) are discussed, with particular reference to grouping and correct nomenclature at the specific level.

All prepared skins have been deposited at the British Museum (Natural History), with duplicates at the Museum Zoologicum, Bogor, Indonesia.

ACKNOWLEDGEMENTS

This work was supported in Indonesia by a fellowship from the Siswa Lokantara Foundation. I am also grateful for facilities offered

by the directors and staff of the following institutes: Museum Zoologicum, Bogor; British Museum (Natural History); Rijksmuseum van Natuurlijke Historie, Leiden; National Museum, Singapore; and Zoologische Museum, Berlin.

Annotated Specimen List

Collocalia esculenta linchi Horsfield & Moore

Local name : *Kapinis* (Sundanese) ; *seriti, kelintji* (Javanese)

Specimens : Mt. Lawu, central Java, 1500 m.[1] 2 unsexed: wing 99, 100, tail 43, 44 (furcation 9%, 11%)

Tepus, Jogjakarta, 40 m. ♀ : wing 99, tail 44 (furcation 5%)

This swiftlet is adequately described elsewhere (Kuroda 1936, Delacour 1947); its small size and white belly are diagnostic. It is abundant throughout the island, at all altitudes. It was seen in numbers in the active crater of Mt. Gedeh (2960 m.) where it appeared to be resident, although no nesting colony was found.

This swiftlet cannot utter the so-called rattle call, which has been shown to be indispensable for echolocation among *Collocalia* (Novick 1959, Medway 1959a, and in press).

Nests: Nests of this swiftlet from Java have been described by Spennemann (1928) and Hoogerwerf (1949); from Lombok by Hartert (1896). They are bracket-shaped (Lack 1956), always made chiefly of strands of vegetable material bound together by a sparse application of the characteristic salivary nest-cement, which is copious only at the base of the nest, at the juncture between nest and supporting wall.

The chief vegetable constituents evidently depend partly on the availability of suitable material, and partly on individual preferences. Thus, in the colony on Mt. Lawu, among cultivated *Pinus* forest at high altitude, all nests were made of the lichen epiphytic on the trees; in a small colony at Klapanunggal, West Java, among agricultural land from which all natural forest cover has been felled, all nests were made of threshed rice ears; nests at Tepus, a barren and deforested area where the chief crop is cassava, were made of blades of grass and broad leaves. But where a variety of acceptable material is available, neighbouring nests may include entirely different kinds of material. For example, three adjacent and partially adjoined nests taken from a house in Bogor (near the Botanical Gardens)

[1] Collected on nests by M. Pierre Jauffret, to whom I am grateful for information concerning the habitat.

consisted of the following principal materials, in approximate proportions: (1) lichen 80%, pine needles 10%, grass; (2) *Arenga* palm fibres 95%, lichen and pine needles; (3) pine needles 70%, casuarina foliage 20%. It is clear from these examples that the precise identity of the vegetable material used in the nest is not taxonomically important; the form and manner of construction of the nest, however, remain constant despite the use of different materials, and it is these that are significant.

Collocalia gigas Hartert & Butler

Specimens : None.

This swiftlet was not seen and I include it only for the sake of completeness.

Nest: Described by Hoogerwerf (1949) as a vegetable nest, with thick walls, mainly consisting of aerial roots and fibrous material.

Collocalia maxima maxima[1] Hume $\gtrless$ **lowi** Sharpe

Local name : *Dekok* (Sundanese)

Specimens: Tjiampea, West Java, 200 m. 3♂, ♀, 1 unsexed: wing 128-136, tail 52-58 (furcation 2-10%)

Dorsum dark blackish-brown; rump slightly paler than back and tail, with dark shaft-lines on paler feathers. Concealed white in the plumage of back and venter (Mayr 1937, Medway 1959b, Sims 1961) is reduced. Tarsi bear a conspicuous row of feathers on the outer-side, and are also feathered, but less conspicuously so, on the inner-side.

This swiftlet utters the rattle call (see above).

The species has not hitherto been recorded from Java.

Nests: Typical bracket-shaped 'black nests' (Medway 1959b, Sims 1961), consisting of the swiftlet's own feathers bound together by copious nest-cement. This species was found in only one cave in the Tjiampea district. It was well known to the local birds' nests contractor, but its nests were regarded as worthless and were not collected. I neither found nor heard indications of another colony of this swiftlet elsewhere in any region of Java that I was able to visit.

Discussion: Black nests are known to be built by *C. maxima maxima* in Malaya and peninsular Thailand (Chasen 1939, under the name *C. lowi robinsoni*), by *C. maxima lowi* Sharpe from Sarawak

[1] Formerly *Collocalia lowi robinsoni* Stresemann. The name *maxima* is based on somewhat disputable grounds (Deignan 1955 a), but since it has already been used by Smythies (1960) and Medway (1959 a, b, and in press), I prefer to retain it.

and North Borneo (Smythies 1960), and by *C. maxima tichelmani* Stresemann from south-east Borneo (Stresemann 1926a). With the addition of the present specimens, these black-nest builders form a natural morphological group of large swiftlets, distinguished by size, by a relatively square, slightly furcated tail, and by a thickly feathered tarsus.

The two races *lowi* and *maxima* are separated by rump coloration. In the former, the rump is entirely concolorous with back and tail; in *maxima* the rump is distinctly paler. The colour of the rump of the present specimens is intermediate and they cannot be assigned definitely to either race, as indicated above. Indistinguishable from these Javanese birds are two skins from Tapanuli, Sumatra, in the Museum Zoologicum, Bogor, (nos. 18165-6), formerly ascribed to the race *lowi* (Peters 1940).

Black nests, indicating the presence of this species, have also been recorded from the mountains of Assam (Stuart Baker 1927, under the name *C. brevirostris*). Among the swiftlet skins from east Bhutan and southern Tibet [Ludlow/Sheriff collection in the British Museum (Natural History)], two forms can be distinguished, attributable to *C. brevirostris* and *C. maxima* respectively; the latter has not previously been recognised from the area. Skins of *C. maxima* are distinguishable by a longer wing, a less deeply forked tail, and a thickly, as opposed to a sparingly, feathered tarsus. Respective measurements, taken from the skins, are: *C. brevirostris* (5 specimens): wing 124-126, tail 51-55 (furcation 15-22%); *C. maxima* (7 specimens): wing 128-135, tail 50-58 (furcation 11-15%). The specimens of *C. maxima* are not distinguishable from the nominate race. Both species occur up to the highest altitude recorded, 12,750 feet (*c.* 3890 m.).

Collocalia brevirostris vulcanorum Stresemann

Specimens : Crater of Tangkuban Perahu, West Java, 2076 m. ♂, 2 ♀ : wing 124-125, tail 54-57 (furcation 11-13%)

Dorsum dark blackish-brown; rump paler than back and tail, a uniform band of greyish-fawn with dark shaft lines. Concealed white in the contour plumage of back and venter is imperceptible. The tarsi of the male are entirely naked; the tarsi of the females bear 2 to 7 small and inconspicuous feathers on the outersides, and are naked on the innersides.

These specimens have been compared with a paratype of *vulcanorum* from the crater of Mt. Gedeh (♀ : wing 122, tail 55, furcation 22%) from the Bartels collection in the Rijksmuseum van

Natuurlijke Historie, and with the type of *brevirostris* in the British Museum (Natural History).

This swiftlet utters the rattle call.

Nests: These birds were netted (1/iv/61) at the mouth of a deep fissure in the wall of the first crater (Kawah Ratu) on Mt. Tangkuban Perahu, into which descent was not possible. Cries of young birds were heard, but nests were not seen.

A nesting colony of this swiftlet was found on Mt. Gedeh, West Java, by Bartels (Kuroda 1936), and was known to Hoogerwerf (1949). But there is no record that the nests were collected, and no published description of them exists. The fissure in the crater wall of Gedeh that used to be occupied by these birds was shown to me. Nowadays it directly overhangs the newest crater opened by the violent eruptions of 1947-8, and is uninhabited. The only swiftlet I saw around the summit of Gedeh was *C. esculenta linchi*, and the colony of *C. brevirostris* is evidently extinct. The only description of their nests available is a volunteered statement by Sdr. Kudit, an employee of Tjibodas Botanical Gardens, who told me that he had entered the cave before the last eruption, and had collected what would purport to be bracket-shaped vegetable nests. Vegetable nests were also found in the crater of Mt. Tjeremai by Junghuhn (see Stresemann, 1926b), but cannot be attributed with certainty to this swiftlet.

Discussion: The taxonomy of this species is particularly confused. Stresemann originally considered all the larger grey-brown swiftlets to be conspecific, uniting them under the prior name of *brevirostris* McClelland. He therefore described the newly discovered form *vulcanorum* as a subspecies of *C. brevirostris* (Stresemann 1926b). Later (1932) Stresemann separated the forms building black nests from *C. brevirostris*, on morphological grounds including *vulcanorum* with the former for which he used the specific name *C. lowi* Sharpe. In the same paper (Stresemann 1932) he tentatively united the controversial *innominata* Hume with the equally controversial *'fuciphaga'* Thunberg (correctly known as *C. salangana* Streubel, see below). No other specimens of *vulcanorum* were collected, and Kuroda (1936), Peters (1940), and Hoogerwerf (1949) all followed Stresemann, assigning this swiftlet to the species *C. lowi* (=*C. maxima*, see above).

C. innominata was distinguished from the black-nest builders (i.e. *C. maxima*) by both Robinson (1928) and Chasen (1939), and has since been shown by Deignan (1955b) to be conspecific with *C.*

brevirostris. Sims (1961) has suggested that *C. brevirostris* replaces *C. 'fuciphaga'* (=*C. salangana*) on the Asiatic mainland; however, the present specimens of *vulcanorum* were found together in the same cave with *C. salangana* (see below) and the two are clearly specifically distinct. The race *vulcanorum* is adequately distinguished from the nominate race *C. b. brevirostris* by the reduced feathering of the tarsus.

Specimens attributable to *C. brevirostris* (wing 125) have also been collected in north Sumatra (Robinson & Kloss 1924: 243, under the the name *C. innominata*). Here they were taken on nests 'made of moss and other vegetable matter fixed to the wall with the well known slimy secretion from the buccal glands'. The specimens discussed (Robinson & Kloss, loc. cit.) have been lost as a result of the war, and I have been unable to compare them with skins from Java.

The species *C. brevirostris* has a wide distribution eastwards from the Himalayas, where it is sympatric with *C. maxima* (see above), through Burma and Thailand. This swiftlet has also been collected in Malaya; but here all specimens were winter-caught and were considered by both Chasen (1939, under *C. innominata*) and Deignan (1955b) to include representatives of a more northerly breeding population which is migratory. This population was named *rogersi* by Deignan (1955b). Measurements of winter-caught Malayan *C. brevirostris* show a wide variation, suggesting a mixed population: (12 specimens) wing 121-132, tail 51-58 (furcation 14-23%). Since the species is now shown to be resident in Sumatra and Java, it is possible that some Malayan specimens also represent a resident population, nesting in the as yet poorly known hinterland. In the circumstances, the position of *rogersi* is obscure. The minimum wing measurement given by Deignan (1955b) is well below the least wing measurement of any other race of *C. brevirostris*, and it is possible that *rogersi* (as defined) includes more than one species.

Collocalia francica fuciphaga (Thunberg)

Local names : *Walet* (Sundanese) ; *lawet* (Javanese)

Specimens: Tjiampea and Klapanunggal, West Java. ♂, 2 ♀, 2 unsexed : wing 111-115, tail 48-53 (furcation 12-16%).

Karangduwur, Central Java, 0 m. 2♂, 3♀: wing 113-118, tail 48-51 (furcation 13-15%)

Dorsum dark blackish-brown; rump very little paler than back and tail; in the midline the exposed parts of the vanes of the rump feathers are in fact quite as dark as the back plumage, and only the

lateral feathers are paler, with dark shaft-lines. One female has tarsi naked, the remainder have tarsi sparsely feathered. Concealed white in the back is pronounced in nestlings and recent fledglings, but on aged birds may be very inconspicuous, reduced to the distal tips of only a few of the fluffy basal barbs. Deignan (1955b) noted a greater amount of concealed white in the contour feathers of juveniles as opposed to aged adults among *C. brevirostris* too, and Sims (1961) noted variation in the extent of the white areas in *C. maxima*. Sims (1961) has suggested that the distribution of concealed white on the basal barbs of the contour feathers of the back might be used to distinguish between those species which possess the character; but it is clear that some caution is required.

This swiftlet utters the rattle call.

Nests: Bracket-shaped 'white nests', in general composed exclusively of nest-cement. Among a large collection of nests from a sea cave at Karangbolang on the south coast, there were a few examples in which filaments of algae were incorporated; these were later identified as 'chiefly *Cladophora*, but also some *Lyngbya* and one fragment of *Sphacelaria*' (Dr. J. Th. Koster, *in litt.* 1962). Similar algae, I was informed by the nest collectors, grew on the spray-splashed rocks around these nests. At the time I had no hesitation in crediting the nest collectors' belief that the inclusion of these algae in the nest was accidental (see Smythies 1960).

This species is responsible for building all white nests throughout the island. The problem of its nomenclature has been discussed elsewhere (Medway 1961).

Collocalia salangana salangana Streubel

Local name : *Lukut* (Sundanese)

Specimens : Tjiampea, West Java, 250 m. 5♂, 6♀, 2 unsexed: wing 115-123, tail 49-54 (furcation 6-17%).

Tangkuban Perahu volcano, West Java. 2076 m. ♀ : wing 123, tail 52 (furcation 10%)

Dorsum uniform dark blackish brown; rump entirely concolorous with back and tail. There is no concealed white in the plumage of back and venter. The tarsi of all specimens from Tjiampea are naked; the left tarsus of the female from the cave in the crater wall of Tangkuban Perahu bears one small feather on the outerside.

This swiftlet utters the rattle call.

Nests: Rounded vegetable nests (see Bartels in Stresemann 1926b). Nests collected from Tjiampea with the present specimens were made principally of *Arenga* fibres, aerial rootlets, threshed rice

ears, fine dead twigs, dead grass, and other leaves; tufted moss formed only a small proportion of the vegetable constituents, and to apply the term 'mossy nest' (Sims 1961) would be misleading. These materials were agglutinated with a sparse amount of soft, moist nest-cement, which was no more copiously applied at the back of the nest than elsewhere. Each nest rested on an irregularity in the cave wall.

Discussion: The presence of this swiftlet in Java was discovered by Stresemann (1914) who restricted the use of the name *fuciphaga* to this species. It was under the name *C. fuciphaga* that it was included by subsequent authors (Stresemann 1925, 1932, Chasen 1935, Kuroda 1936, Peters 1940, Sims 1961). However, as shown elsewhere (Medway 1961) the name *fuciphaga* must be applied to the previous species (above), and the builder of rounded vegetable nests is correctly known as *C. salangana*. The nominate race *salangana* can be distinguished from the race *natunae* Stresemann of the Natunas and Borneo (Medway 1959b, under *C. fuciphaga natunae*) by the very reduced (or totally absent) feathering of the tarsus.

References

Chasen, F. N. (1935) : Handlist of Malaysian Birds. *Bull. Raffles Mus.* **11** : 1-389.

——————(1939): Birds of the Malay Peninsula. Vol. IV. Witherby & Co., London.

Deignan. H. G. (1955a) : The identity of *Collocalia maxima* Hume. *Bull. Brit. Orn. Cl.* **75** : 82.

——————(1955b): The races of the swiftlet *Collocalia brevirostris* (McClelland). *Bull. Brit. Orn. Cl.* **75** : 116-118.

Delacour, J. (1947): Birds of Malaysia. MacMillan, New York.

Hartert, E. (1896) : A collection of birds made in Lombok. *Nov. Zool.* **3** : 591-599.

Hoogerwerf, A. (1949):De Avifauna van Tjibodas en omgeving. Bogor.

Kuroda, N. (1936) : Birds of Java. Vol. II. Tokyo.

Lack, D. (1956) : Genera and nesting habits of swifts. *Auk* **73** : 1-32.

Mayr, E. (1937) : *Collocalia. Am. Mus. Novit.* **915** : 1-19.

Medway, Lord (1959a) : Echolocation among *Collocalia. Nature* **184** : 1352-1353.

—————————— (1959b) : Thunberg's Swiftlet, *Collocalia fuciphaga. Sarawak Mus. J.* **8** : 683-689.

——————(1961): The identity of *Collocalia fuciphaga* (Thunberg). *Ibis* **103** a : 625-626.

Novick, A. (1959) : Acoustic orientation in the cave swiftlet. *Biol. Bull.***117**: 497-503.

Peters, J. L. (1940) : Check-list of Birds of the World. Vol. IV. Harvard University Press, U. S. A.

Robinson, H. C. (1928): Birds of the Malay Peninsula. Vol. II. Witherby & Co., London.

—————————— & Kloss, C.B. (1924) : Birds from west Sumatra. *J. Fed. Malay States Mus.* **11** : 189-347.

Sims, R. W. (1961) : The identification of Malaysian species of swiftlets. *Ibis* **103**a : 205-209.

Smythies, B. E. (1960): Birds of Borneo. Oliver and Boyd, Edinburgh.

Spennemann, A. (1928) : *Collocalia esculenta linchi. Beitr. Fortpfl. biol. Vog.* **4** : 53-58, 98-103.

Stresemann, E. (1914) : Was ist *Collocalia fuciphaga*? *Ornith. Ges. Bayern* **12** : 1-12.

—————————— (1925) : Bruchstucke einer Revision der Salanganen. *Mitt. Zool. Mus. Berlin* **12**:179-190.

—————————— (1926a) : Kenntnis der Salanganen S. O. Borneos. *Ornith. Mbr.* **34** : 104-108.

—————————— (1926b): Bruchstucke einer Revision der Salanganen, II. *Mitt. Zool. Mus. Berlin* **12** : 349-353.

—————————— (1932) : Swiftlets of Malaysia. *Bull. Raffles Mus.* **6**: 83-94.

Stuart Baker, E. C. (1927) : Fauna of British India, Birds. Vol. IV. Taylor and Francis, London.

Critical Notes on the Orchidaceae of Bombay State

VIII. SOME OF THE SMALLER GENERA

BY

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(*With six plates*)

[*Continued from Vol.* **58** (3) : 607]

1. *SPIRANTHES* L. C. Rich.

SPIRANTHES L.C. Rich. in Mem. Mus. Paris 4 : 50, 1818, nom. cons. ; Endl. Gen. Pl. 212, 1837; Benth. & Hook. f. Gen. Pl. 3 : 396, 1883 ; Pfitz. in Engl. & Prantl, Pflanzenf. 2 (6) : 113, 1888 ; Hook. f. Fl. Brit. Ind. 6 : 102, 1890 ; King & Pantl. in Ann. R. Bot. Gard. Calcutta 8 : 276, 1898 ; Duthie, ibid. 9 (2) : 163, 1906 ; J. J. Smith, Fl. Buitenz. 6 : 81, 1905 ; Schltr. Orchid. 109, 1927 ; Correl, Nat. Orch. N. America 184, 1950 ; Holttum, Rev. Fl. Malaya 1 : 139, 1953. *Gyrostachis* Pers. Syn. 2 : 511, 1807. *Ibidium* Salisb. in Trans. Hort. Soc. 1 : 291, 1812, nom. nud.

The name *Spiranthes* is derived from the Greek words *speira* = a spiral or a coil, and *anthes* = a flower, in allusion to the spiral arrangement of the flowers in many of the species.

A polymorphic genus of about 300 species, widely distributed throughout the temperate zones of both hemispheres. One of the few orchid genera with round-the-world distribution.

According to Correll, these plants flourish under a variety of habitats. This ability to adapt themselves to various habitats may be the reason for the world-wide distribution of the genus.

Spiranthes lancea (Thunb. ex Sw.) Backer, B. v. d. Brink Jr. & v. Steenis in Blumea 6 : 361, 1951 ; Holttum, 734, add. *Ophrys lancea* Thunb. ex Sw. in Vet. Acad. Handl. Stockh. 21 : 233, 1800. *Aristotelia spiralis* Lour. Fl. Coch. 522, 1790, (non *Spiranthes spiralis* Koch. 1849). *Epidendrum aristotelia* Raeusch. Nomencl. ed. 3, 265, 1797. *Neottia sinensis* Pers. Syn. 2 : 511, 1807. *Spiranthes australis* Lindl. in Bot. Reg. 10 : sub t. 823, 1824 ; Lindl. in Journ. Linn. Soc. 1 : 178, 1857 ; Wight, Icon. 5 (1) : 15, t. 1724, 1851 (media fig. et dextra tantum) ; Dalz. & Gibs. Bomb. Fl. 270, 1861 ; Hook. f. N. Zeal. Fl. 272, 1867 ; Hook. f. 102 ; King & Pantl. 278, t. 369 ; Prain, Beng. Pl. 1038, 1903 ;